



LITHIC TECHNOLOGY

ARKY 415
Winter 2019

Dr. Elizabeth Paris
Department of Anthropology and Archaeology

LEC: TR 09:30 – 10:45, ES 859
LAB: R 10:45 – 12:00, ES 859

COURSE DESCRIPTION

This course will introduce you to The analysis of stone (lithic) tool form, manufacture, and use as applied to reconstruction of past human lifeways. Topics covered include: methods of shaping stone into tools; reconstruction of the lithic reduction process and stages from discarded debitage; lithic fracture mechanics; identification of lithic material types and sourcing to specific quarries; the meaning of stone tool morphology; tool typology; lithic usewear analysis; and the integrative use of these sources of information to reconstruct aspects of tool use, activity areas, site type, settlement patterns, social group, cultural change through space and time, and trade.

Prerequisite: ARKY 201

WHAT WILL YOU LEARN?

By the end of this course, students should be able to:

- Grasp the historical development of the field of stone tool analysis in archaeology, including theoretical approaches and methods used in archaeology today.
- Apply archaeological methods, techniques and concepts through lab exercises.
- Understand the sources of analogy and principles of experimentation by which researchers test hypotheses regarding ancient technologies.
- Practice hands-on learning and develop basic skills in flintknapping and use-wear analysis.

Office: ES 818

Office Hours: M 1:00-2:15 PM and by appointment

EMAIL: ELIZABETH.PARIS@UCALGARY.CA

TA: Nathan Parrott

TA Office Hours: W 1:00-2:15 pm

TA Email: Nathan.parrott@ucalgary.ca

Any emailed questions should be first directed to the TA, and will be referred to the instructor as necessary. Please expect 48 hours for a response. If more than 48 hours have passed with no reply, check the email address and re-send. Please use your UCalgary email address for course business.

REQUIRED READINGS

Course textbooks:

Brian Kooyman. 2000. *Understanding Stone Tools and Archaeological Sites*. University of Calgary Press and University of New Mexico Press.

John C. Whittaker. 1994. *Flintknapping: Making and Understanding Stone Tools*. University of Texas Press, Austin.

Additional readings and Youtube video links will be listed on D2L. Library links to articles, book chapters and videos will be posted on D2L in modules that correspond to the week in which they are due.

All readings and videos are required! Please check the schedule below for readings and due dates.

COURSE STRUCTURE

Grades will be based on the following course activities:

1.	Participation	10%	See schedule
2.	Discussion leadership	10%	See schedule
3.	Lab exercises	20%	See schedule
4.	Lab quizzes	20%	See schedule
5.	Lithic Analysis Final Project	40%	Portions due April 2 and April 13

NOTE: There is no registrar-scheduled final examination for this course.

In this class, grades are assigned according to the following chart:

Percentages	Letter grade	Interpretation
97-100%	A+	<i>The A range denotes excellent performance.</i>
90-96%	A	
86-89%	A-	
82-85%	B+	<i>The B range denotes good performance.</i>
78-81%	B	
74-77%	B-	
70-73%	C+	<i>The C range denotes satisfactory performance.</i>
66-69%	C	
62-65%	C-	
56-61%	D+	<i>The D range denotes unsatisfactory performance.</i>
50-55%	D	
<50%	F	<i>An F denotes failing performance.</i>

ASA FLINTKNAPPING AND STONE TOOLS WORKSHOP

The Archaeological Society of Alberta has traditionally held a Flintknapping and Stone Tools Workshop. The workshop is traditionally held over two days (Saturday and Sunday) on either the first or second weekend in March. There is a cost associated with the workshop, and there is also a one-day discount for students. Attendance is encouraged, although not required for the course.

EVALUATION METHODS

While there are two scheduled time blocks for lecture and lab for this class, in reality, there will be less of a separation between the activities of lectures vs. labs than the scheduling would suggest. You will be expected to attend both portions of the class, and participate fully in all aspects of the class, no matter when they are scheduled.

1. PARTICIPATION (10%)

This course will be in a seminar format, and students will be graded for their participation in in-class discussions and activities.

- Grading for “participation” assumes that you come to class regularly and on time, ready to talk about the required reading/assignments, and to participate in the lab activities. Your in-class comments during discussion should demonstrate to me that you have done the readings and thought seriously about them. You must also follow the rules of course etiquette (see below).
- Your participation grade will also include your participation in lab activities. This includes full participation in activity-based labs, and meeting progress goals for the final project. You are expected to remain for the entire lab period and make progress on your project; participation points will be deducted if you do not.
- Participation grades for each course meeting will be assessed out of 5 points, which will include participation in lecture discussions and lab activities. You will receive a separate grade for submitted practice labs.
- If you find you are having difficulties in class, please come and see myself or the TA early in the semester to work on them. It will be hard to turn things around if you wait until the last two weeks of class to seek help.

2. DISCUSSION LEADERSHIP (10%)

During the second week of class, you will sign up for discussion leader project dates in groups of 4 (with one or two groups of 5, depending on enrollment). You will work together to create a 25 (or 30) minute presentation on a single topic related to lithic technology, to be agreed upon by the group, and approved by the professor. Each student will present and lead discussion on one article: these must include each of the peer-reviewed articles assigned for the day, and the group will also choose one or two new articles (published in the last 15 years) to incorporate into the presentation, such that each member presents one article. The new article needs to be uploaded to a D2L folder by the day of the presentation (in the form of a stable URL from the library or open access link) so that other students in the class can read it ahead of the course meeting. Students should divide the spoken portion of the presentation evenly between them, and also work collectively to create the Powerpoint. Students will be graded both on the appropriateness of their own article for the topic, and the success of the in-class presentation as a whole.

3. LAB EXERCISES (20%)

There will be scheduled Lab Exercises throughout the course. These are a very important course component, as they will provide hands-on experience with course concepts. Some exercises will involve practical exercises using type collections; others will involve hands-on flintknapping and other experimental methods. In most cases, there will be a worksheet to fill out and turn in at the end of class; in some cases, there will be additional portions of the exercise to complete at home, to turn in at the beginning of the following course meeting. Please see the course schedule below. The lab exercises may vary as to the number of marks they are worth. “Project Days” will form part of these marks; the average scores for the “boxes” for your final project will represent 5%, while the other lab exercises will constitute the remaining 15%. In total, Lab Exercises will represent 20% of your final course grade.

You need to make sure to dress appropriately for this class. Flintknapping days and use-wear analysis days will require long pants and close-toed shoes. You will also be required to wear protective eyewear and gloves; you may wish to wear a labcoat to protect your clothing during certain lab activities. Protective eyewear and kneepads will be provided during flintknapping. You will be required to purchase your own protective leather gloves to wear during flintknapping, as student hand size varies significantly. We have only a few lab coats available to be borrowed on a first-come, first-served basis, so please supply your own lab coat if you intend to wear one.

4. LAB QUIZZES (20%)

There will be five lab quizzes in the course. Please see the course schedule below for the quiz dates. Quizzes will take place first thing during the lecture portion of the class. The quizzes will require you to apply the knowledge that you have learned from previous lab exercises to a set of unlabeled specimens. Each quiz will be worth 4% of your final course grade, for a total of 20% of the final course grade.

5. LITHIC ANALYSIS FINAL PROJECT (40%)

The final project in this course will simulate the type of investigation that you would be expected to perform as a lithic analysis specialist on a professional research project, whether in academia or the public sector. For this project, you will analyze an actual archaeological sample of approximately 300 specimens. You must hand in a research report that contains a full analysis of your sample, using the techniques that have been taught throughout the class.

A separate Lithic Analysis Final Project Handout will be given to you with the specifications for the assignment. Make sure to follow the directions very carefully in order to receive credit.

Please note that you will receive some class time to complete the projects, but you should also plan to spend extra time outside of class to complete your analysis. Access to the prep room will be granted conditional on continuing appropriate usage; access to comparative collections may be arranged during instructor/TA office hours. You may email the instructor or TA to ask if they are willing to supervise at other times, but this is not guaranteed, and completely subject to instructor/TA availability and discretion.

Removing any lithic specimens from laboratory spaces is not permitted for any reason. This includes materials assigned for projects and comparative collections. Removing course materials, knowingly or negligently damaging collections and/or university equipment will be reported to the university as misconduct. At the instructor's discretion, the misconduct may result in failure of the assignment and/or the course.

MAKEUP POLICY

Participation: Participation in lecture discussions and lab activities will be assessed on a daily basis. Each student is allowed one "sick day" emergency absence, documented by emailing the instructor as soon as possible. To be officially excused from any additional course meetings, emergency circumstances will need to be confirmed with the instructor through supporting documentation. There are 24 total course meetings, meaning that your attendance will be calculated as a specific proportion of 24 meetings. Two late arrivals (i.e., walking into class after course activities have begun) will count as one absence when calculating participation. Where students have excused absences with documentation, the grade will be calculated as a proportion from the course meetings attended.

Labs and Quizzes: Rescheduling of examples labs, practice labs, and quizzes is extremely difficult due to their involved nature. Official excused absences must be reported to the instructor and TA as soon as possible, and students will need to be flexible and work with us for any attempts to reschedule.

Discussion Leadership: There are limited opportunities to schedule a missed discussion leader session. It is thus important that you honor your commitment. If an officially excused conflict develops during the semester, please let me know as soon as possible in order to re-schedule your session. Depending on the circumstances, you may be required to join another group whose presentation is scheduled later in the semester.

Final Projects: Project may only be turned in late with an official excuse as per university policy. As it is possible to turn in written assignments prior to the due date, foreseen schedule conflicts resulting from

university athletic competitions, religious observances, etc. must be arranged individually with the professor in advance. Unforeseen emergency or situations should be reported to the professor as soon as possible, and any alternative arrangements will be based on individual circumstances.

COURSE SCHEDULE

Students should do all readings and assignments during the week in which they are assigned.

**Note that this syllabus is subject to change at any time at the professor's discretion.

Week	DUE DATE	TOPICS AND READINGS
Week 1	R, Jan. 10	Topic: Introduction to the course Film: Flintknapping by Bruce Bradley
Week 2	T, Jan.15	Topic: Physics and Fracture Mechanics Read: Kooyman Chapters 1 and 2, Whittaker Chapter 1 Lab Exercise 1: Fracture Mechanics and Flake Features
	R, Jan. 17	Topic: Raw Materials, Quarries, and Sources Read: Kooyman Chapter 3, Whittaker Chapter 4 Lab Exercise 2: Sourcing
Week 3	T, Jan. 22	QUIZ 1: Fracture Mechanics and Flake Features Lecture: Sourcing, Compositional analysis, X-ray Fluorescence Read: Kooyman Chapter 4, Braswell et al. 2000 Optional: Kristensen et al. 2016
	R, Jan. 24	Topic: Manufacturing Techniques/Reduction Stages, Behavior Analysis vs. Chaine d'Operatoire Read: Kooyman Chapter 5, Sheets 1975, Bar Yosef and Van Peer 2009 Optional: Clark and Bryant 1997, Bleed 2001 Lab Exercise 3: Reduction Stages
Week 4	T, Jan. 29	QUIZ 2: Raw Materials and Sources Topic: Debitage and Mass Analysis Read: Bradbury and Carr 2014, Andrefsky 2007 Optional: Ahler 1989
	R, Jan. 31	Topic: Tool Classification, Northwest Plains Lithic Technology Read: Kooyman Chapters 6 and 8, Whittaker Chapter 3 Optional: Driver 1993 Lab Exercise 4: Tool types Read: Kooyman Chapter 9
Week 5	T, Feb. 5	QUIZ 3: Reduction Stages Topic: Formal vs. Informal Tools Read: Andrefsky 1994; Paris 2012
	R, Feb. 7	Topic: Groundstone Tools Read: Adams 2013 Chapters 1-2

		Review: Kooyman Chapter 5 pp. 64-65 Optional: Kovacevich and Callaghan 2018 Lab Exercise 5: Groundstone
Week 6	T, Feb. 12	QUIZ 4: Tool types Topic: Sources of Analogy: Experimental Archaeology Read: Kooyman Chapter 7, Sheets and Muto 1972, Clark 1985 Lab Exercise 6: Flintknapping Day 1, Orientation to flintknapping techniques Read: Whittaker Chapters 1-3
	R, Feb. 14	Topic: Sources of Analogy: Ethnohistory and Ethnoarchaeology Read: Hitchcock and Bleed 1997, Nations and Clark 1983 Lab Exercise 7: Flintknapping Day 2, Direct and Indirect Percussion Read: Whittaker Chapters 4-5
Week 7	T, Feb. 19	READING WEEK
	R, Feb. 21	READING WEEK
Week 8	T, Feb. 26	Topic: Wider Applications in Lithic Analysis Read: Kooyman Chapter 10, Whittaker Chapter 11 Lab Exercise 8: Flintknapping Day 3, Pressure Flaking Read: Whittaker Chapter 6-8
	R, Feb. 28	QUIZ 5: Cumulative Review Topic: Stone tools and human origins I Read: Shea 2007; Beyene et al. 2012; Harmand et al. 2015 Optional: Anonymous 2015 Lab Exercise 9: Flintknapping Day 4
Week 9	T, Mar. 5	Topic: Usewear and Tool Function Read: Kooyman Chapter 11, Odell 1980, Lewenstein 1991 Optional: Bamforth 1988, McKillop and Aoyama 2018 Lab Exercise 10: Flintknapping Day 5
	R, Mar. 7	Lab Exercise 11: Usewear Replication and Analysis (3 hour lab exercise)
Week 10	T, Mar. 12	Topic: Projectile Technology: Design, Durability and Reshaping Discussion Group 1 Read: Hurst Thomas 1978, Flenniken and Raymond 1986, Hurst Thomas 1986 Lab Exercise 12: Use-wear microscopy
	R, Mar. 14	Topic: Mesoamerican Warfare and Weapons Discussion Group 2 Read: Cervera Obregón 2006, Aoyama 2005 Optional: Carballo 2007 Lab: Project Day 1
Week 11	T, Mar. 19	Topic: Lithic Craft Production and Specialization

Week 12		Discussion Group 3 Read: Costin 1991, Bamforth and Finlay 2008 Optional: Ferguson 2008, Schortman and Urban 2004 Lab: Project Day 2
	R, Mar. 21	Topic: Workshops vs. Activity Areas vs. Middens Discussion Group 4 Read: Shafer and Hester 1991, Moholy-Nagy 1997 Optional: Hayden and Cannon 1983, Shafer and Hester 1983; Mallory 1986, Shafer and Hester 1992 Lab: Project Day 3
	T, Mar. 26	Topic: Exchange and Inequality Read: Aoyama 1994, Madhusudan Mehta et al. 2017, Springer et al. 2018, Lab: Project Day 4
	R, Mar. 28	Topic: Preparing Professional Reports and Publications Read: Porter 2013; Porter 2014 Lab: Project Day 5
Week 13	T, Apr. 2	Lab: Project Day 6 Lithic Database DUE on D2L at 11:59 pm
	R, Apr. 4	Topic: Residues on Stone Tools Discussion Group 5 Read: Kooyman et al. 2001, Liu et al. 2017 Review: Kooyman Chapter 11 Lab: Project Day 7
Week 14	T, Apr. 9	Topic: Lithics in Religion and Ritual Discussion Group 6 Read: Aoyama 2014, Stemp and Awe 2014, Sievert 1994 Lab: Project Day 8
	R, Apr. 11	Topic: Practicing Lithic Analysis in Professional Archaeology Read: TBA Lab: Project Day 9
	Saturday, April 13	Lithic Project DUE on D2L at 11:59 pm

CLASSROOM ETIQUETTE

- Please make this class a scheduling priority. Arrive on time, and do not leave before the end of the period. During the "lecture" time blocks, you should not leave the room and come back during the class. It is more distracting than you might realize. During the labs, we will schedule a *short* break during the lab, but if you need to use the restroom or grab a drink of water, please do so quietly and discretely. However, you may not leave the room during a scheduled lab quiz, for academic

honesty reasons. If you have to leave class early for a legitimate personal reason or emergency, let me know in advance if possible, and do so without disrupting class.

- Food is not permitted in lab classes, because it can leave damaging residues on artifacts and analysis surfaces. If you bring food on a lab day, you will be asked to throw it out. You may bring a drink in a sealed, non-spill container, which you should keep stowed in the cubbies whenever we engage in lab exercises. This is a long seminar with a substantial lab component, so plan accordingly. If you anticipate being hungry, eat breakfast before coming to class. You may step out of the classroom for a quick snack during the short break—but you must make sure to wash your hands with soap and water before returning to class.
- This class includes lab activities that have mild safety risks, including flintknapping and use-wear analysis. By remaining in the class, you agree to promptly follow all safety instructions from the professor and teaching assistant. Unsafe behavior will not be tolerated, and may result in your removal from the class.
- Students are required to remain until the end of the lab period to assist with clean-up activities following labs, and to dispose of all materials in a safe manner, as directed by the instructor and TA.
- Treat everyone in the class as a colleague—show respect to your fellow students, TA, and instructor, even if you strongly disagree with someone's opinion. Be friendly, courteous and kind during discussions. Do not talk over or interrupt the instructor or other students.
- Silence and stow your phones, and do not use them during class. They are distracting to everyone.
- You may only use laptops and tablets for note-taking purposes. Using them for other activities is highly distracting. If I observe that your laptop or tablet is distracting your fellow students, I will ask you to place it on the podium, and you will lose participation points for that day.
- Course materials prepared by the instructor, together with the content of all lectures presented by the instructor, are the property of the instructor. You may not make video and audio recordings of lectures and labs without the explicit consent of the instructor, nor transfer them to another student, whether or not that student is enrolled in the course.

STUDENT ACCESSIBILITY SERVICES ACCOMODATIONS

Students needing an accommodation because of a physical, psychiatric/emotional, or learning disability that may impact on your ability to carry out assigned course work, please contact Student Accessibility Services at (403)220-8237.

It is the responsibility of the student to request academic accommodations. Students who have not registered with Student Accessibility Services are not eligible for formal academic accommodation. Students who have registered with SAS prior to the start of the semester are required to discuss their needs with the professor no later than ten (10) business days after the first day of class for the course. Students with a recent diagnosis of a disability, a change in status of a disability, or a temporary disability may request accommodations outside of this timeline, but should discuss their needs with the professor as soon as possible.

Please consult the website for more information: www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities_0.pdf

WRITING ACROSS THE CURRICULUM

Writing skills are not exclusive to English courses, and in fact, should cross all disciplines. The University supports the belief that throughout their University careers, students should be taught how to write well so that when they graduate, their writing abilities will be far above the minimal standards required at entrance. Consistent with this belief, students are expected to do a substantial amount of writing in their university courses and, where appropriate, instructors can and may use writing and the grading thereof in the evaluation of student work. The services provided by the Writing Centre in the Effective Writing Office can be utilized by all students who feel they require further assistance.

ACADEMIC MISCONDUCT

The pursuit of knowledge in the University community must be carried out with sincerity, truthfulness, and integrity. Students at the University of Calgary are expected to uphold high academic standards. Academic misconduct will not be tolerated in this class. Students are expected to be aware of all of the types of activities that constitute academic misconduct, and should read the Student Misconduct section of the University Calendar to make sure they know what those are:

<http://www.ucalgary.ca/pubs/calendar/current/k-2-1.html>

The most common forms of academic misconduct include (but are not limited to):

- Presenting another student's work as your own, or copying another student's work.
- Presenting an author's work or ideas as your own, or failing to attribute these ideas correctly through full in-text and/or bibliographic citations.
- Using work completed for another course.
- Using unauthorized notes or other materials during labs and quizzes.

In this course, students who do not abide by the Academic Misconduct policy will be dealt with following the procedures outlined in the University Calendar. Students may receive a failing grade, and a notation of academic misconduct will be placed on the student's record.

EMERGENCY EVACUATION

In the event that the classroom is evacuated due to an emergency situation, please note that the primary assembly point shall be at the ICT Food Court.

Please consult the website for further information: <http://ucalgary.ca/emergencyplan/assemblypoints>

USRI

At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference, please participate!

Website: <http://ucalgary.ca/usri>